the ZENITH Story

A HISTORY FROM 1919

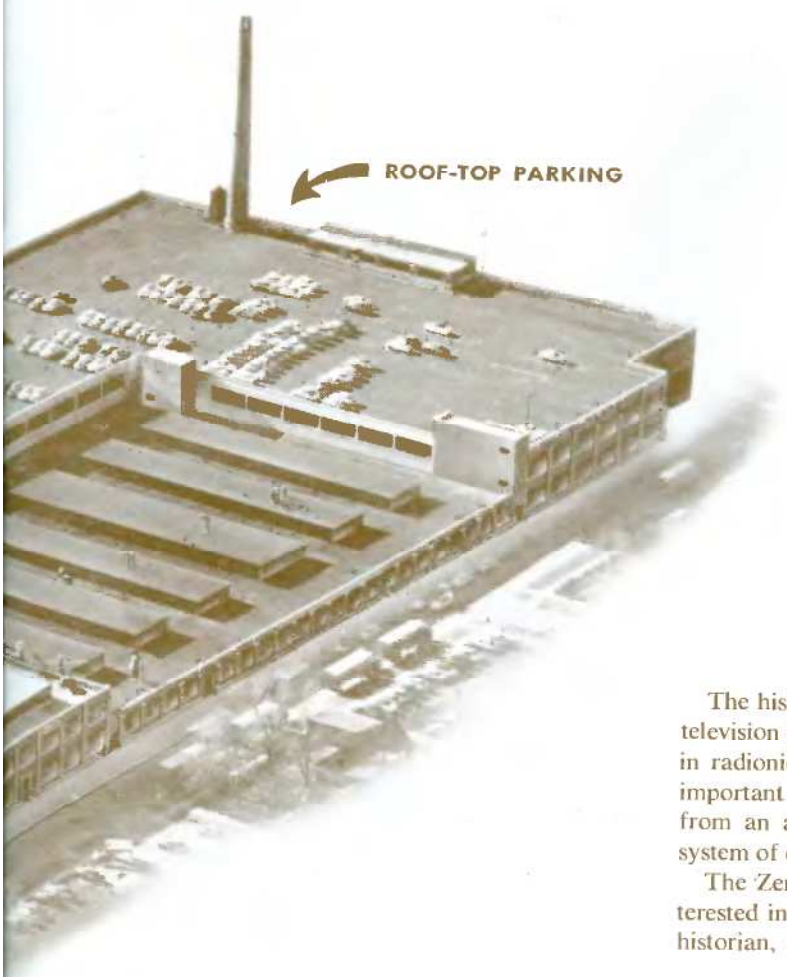
ZENITH RADIO CORPORATION • CHICAGO

Zenith Radio Corporation

PARENT COMPANY PLANTS

Plant Number One
6001 West Dickens Avenue, Chicago
General Offices, Engineering,
Research and Manufacturing

Plant Number Two
1500 N. Kostner Avenue, Chicago
Manufacturing



The Zenith Story

The history of Zenith is to a considerable degree a history of the radio-television industry. This is so because Zenith has been a pioneer and leader in radionics since before there was a radio industry, and has played an important role in almost every important development during radio growth from an amateur toy to the most significant, widespread, and effective system of communications in history.

The Zenith story has been written because we believe you will be interested in this exciting field of radionics—whether you be student, writer, historian, or a normally curious person who appreciates factual drama.

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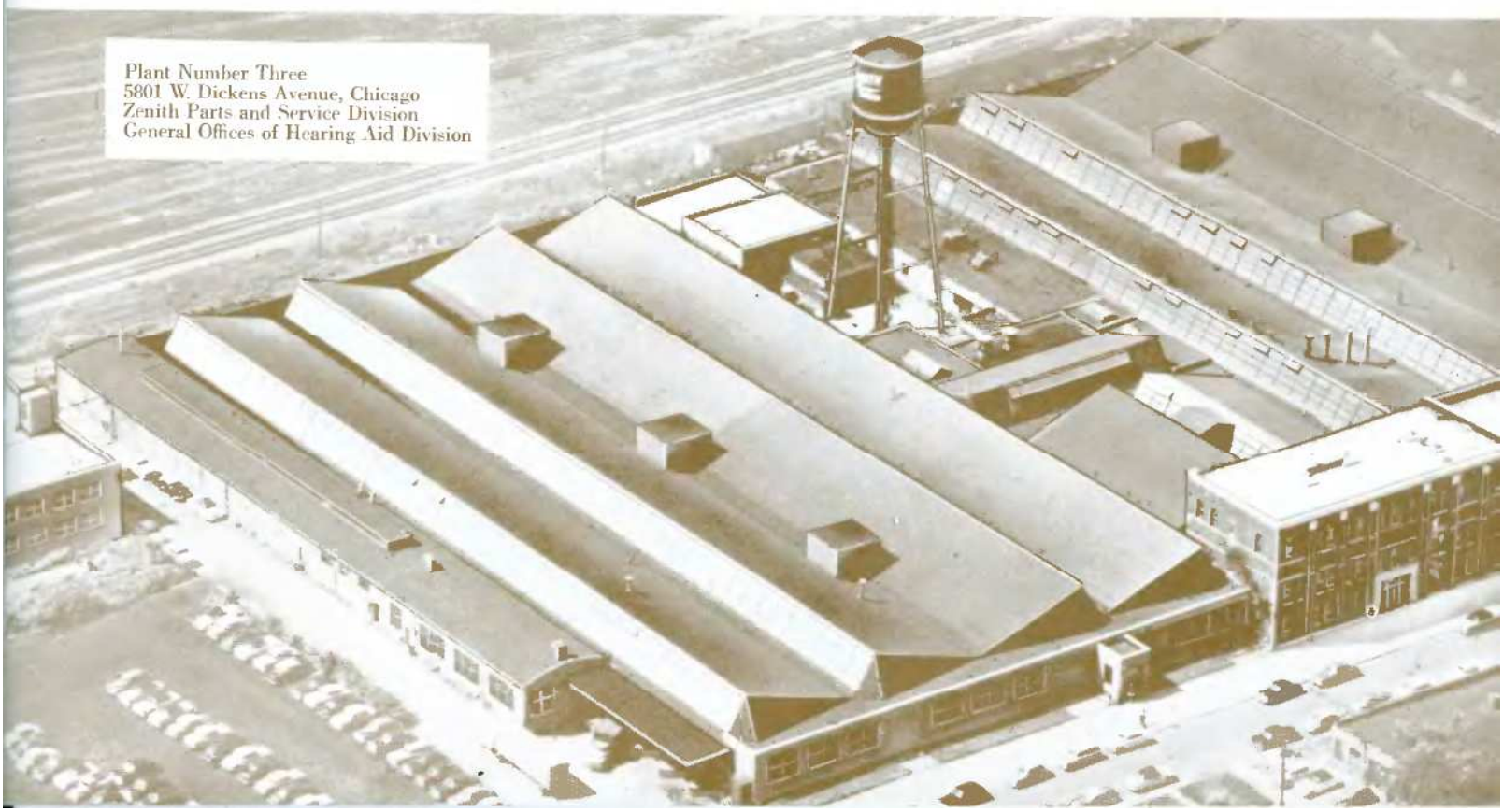


Plant Number Three
5801 W. Dickens Avenue, Chicago
Zenith Parts and Service Division
General Offices of Hearing Aid Division

In 1919, this shack on Chicago's North Side housed station 9ZN and a factory for Z-Nith radio products.

THE ZENITH STORY

On December 14, 1901, Guglielmo Marconi flashed the letter "S" across the Atlantic Ocean by wireless telegraph, and thereby launched a revolution in communications that was destined to bring profound changes in the pattern of civilization.

Marconi's tremendous achievement brought only passing attention from the adult public, but it kindled the imagination of eager youngsters everywhere. In the decade that followed many of these youngsters dismayed their parents by devoting more time and effort to "Marconi's toy" than to preparing themselves for a future in "something practical".

BEGINNINGS

Two of these "wireless doodlers" lived hundreds of miles apart, and were to meet only by sheer chance. R. H. G. Mathews of Chicago pursued the hobby and qualified as an amateur radio operator in 1912. In 1915 he began building and selling wireless equipment to other amateurs. Karl Hassel of Sharpsville, Pa., won his amateur license in 1915, and then matriculated at the University of Pittsburgh. Here he discovered that he was the only person on the campus, student or faculty, who knew how to operate the University's newly constructed wireless station.

Came World War I, and both boys enlisted in the Navy. They met at Great Lakes Naval Training Station, and worked together on radio until 1919. They then set up a continuation of Mathews' business as Chicago Radio Laboratory, building and selling radio sets.

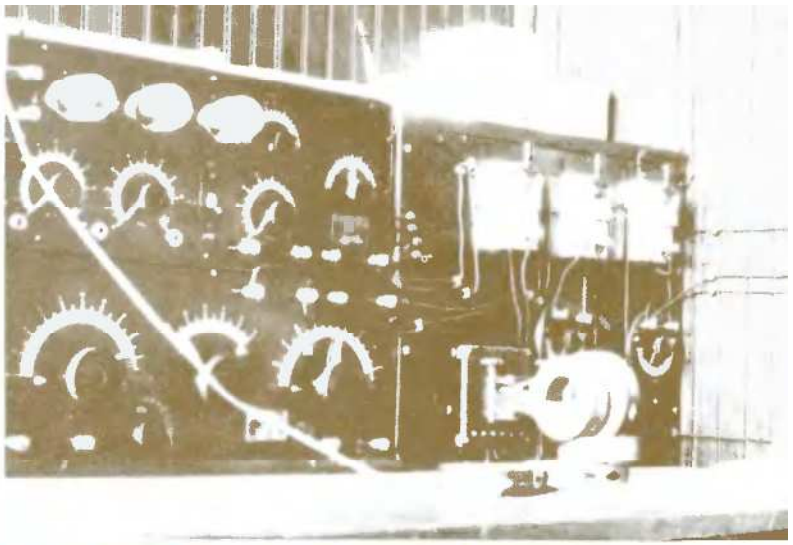
Their first factory was a table in Mathews' kitchen. Their tools were pliers, screwdrivers, a hand drill, and a soldering iron that had to be heated over the burner of a gas stove. From this kitchen table workshop grew the business that was to become Zenith Radio Corporation.

Early in their business life Mathews and Hassel began the long series of radio "firsts" that has become a Zenith tradition. One of their first ventures was construction of a long wave radio receiver for the Chicago *Tribune*, which was used to pick up news dispatches about the Versailles Peace Conference from a long wave station in France. This short circuiting of the congested trans-Atlantic cable enabled the *Tribune* to beat competitors by 12 to 24 hours on conference stories.

The varnish had scarcely dried on the kitchen table workbench before the fledgling business needed larger quarters. The boys built a new factory near the Edgewater Beach Hotel. It was a shanty-like structure that gave them a working space of fourteen by eighteen feet, with a cubby hole for their amateur radio station, 9ZN. At about the same time they published their first catalogue. A few months later they coined the trade name, Z-Nith, from the call letters of their radio station. This was the origin of the trade mark, *Zenith*.

The next Z-Nith first was construction and installation of a wireless system that made the N. C. & St. L. the first railroad in the world to successfully dispatch trains by wireless telegraph. Transmitters and receivers were set up in Tullahoma, Tennessee and Guntersville, Alabama to handle traffic over the rough country between.

Zenith long-wave equipment put the *Chicago Tribune* 12 to 24 hours ahead on news of the Versailles Peace Conference.



First known railroad radio, this 1919 Z-Nith radio-telegraph equipment dispatched N. C. & St. L. trains.

Initial difficulties included such things as setting off a bank's burglar alarm during a directors' meeting; adding a high voltage shock to the pain of a dentist's drill while he was working on a touchy patient; and putting nearby telephones out of service. These problems were ironed out. The system went into service, and operated successfully for several years.

By the end of 1919, the Z-Nith partnership was thriving, with production exceeding one complete set a week. In May, 1920, the boys acquired their most important asset, a license to use the basic regenerative circuit patent of radio's greatest inventive genius, the late Major Edwin H. Armstrong.

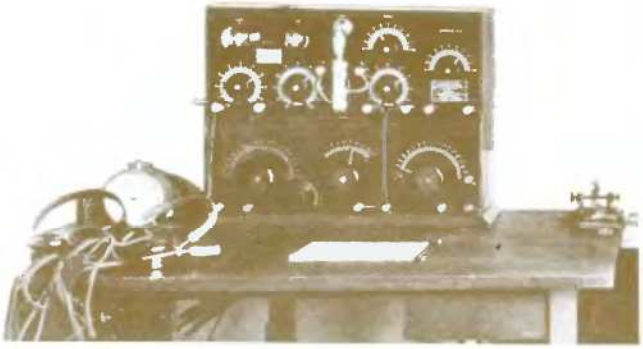
Until the latter part of 1920, Chicago Radio Laboratory concentrated on building equipment for the growing army of radio amateurs, or "hams" as they soon came to be known. A change came in November of that year.

Radio broadcasting as we know it today was nonexistent. The University of Wisconsin had begun in 1919 a regular broadcast schedule of news, market reports, weather information, and general programs from its station 9XN (now WHA).

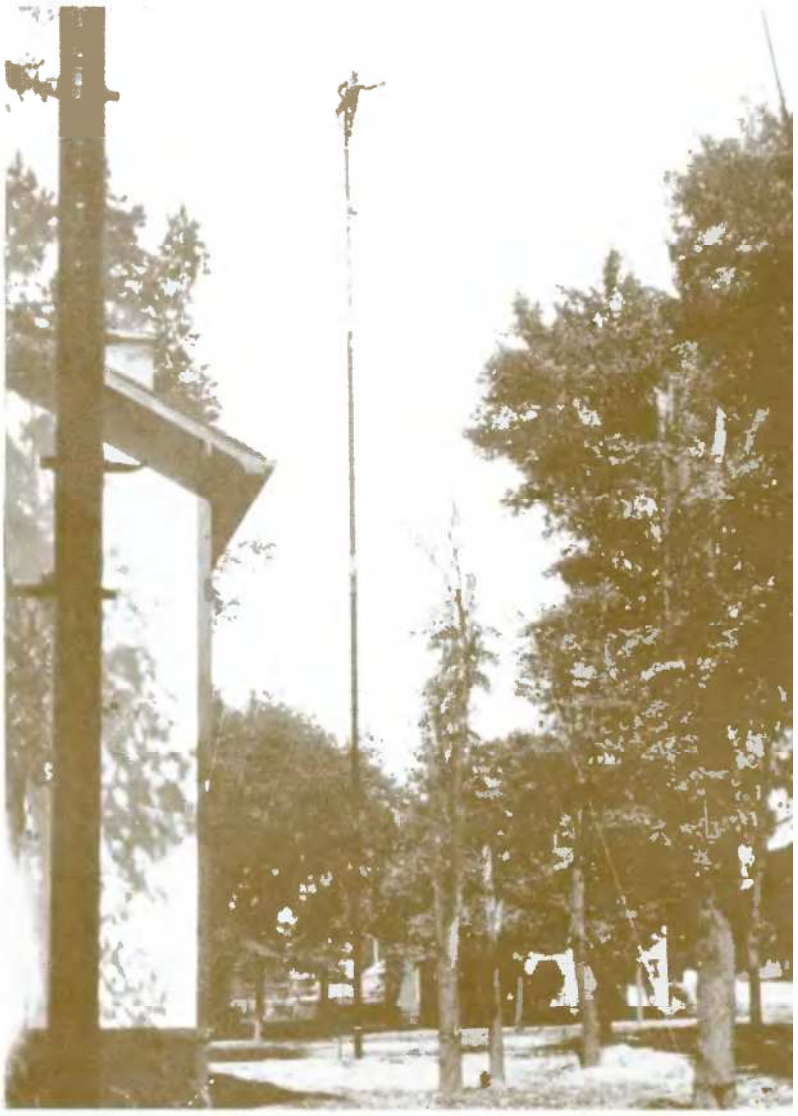
As a public service for radio amateurs WHA developed a unique program. Each noon it radio-telegraphed the weather report in fast code for expert "hams". The report was then repeated in slow code so that beginners could take it. After that, an announcer read the weather report for the general public, and so that beginner "hams" could check their accuracy.

Here and there around the country other stations produced similar schedules, but only a narrow segment of the public showed interest.

Then came the presidential election of 1920. News of the Harding landslide was disseminated with startling speed throughout the country by station KDKA in Pittsburgh and other stations. The public suddenly realized



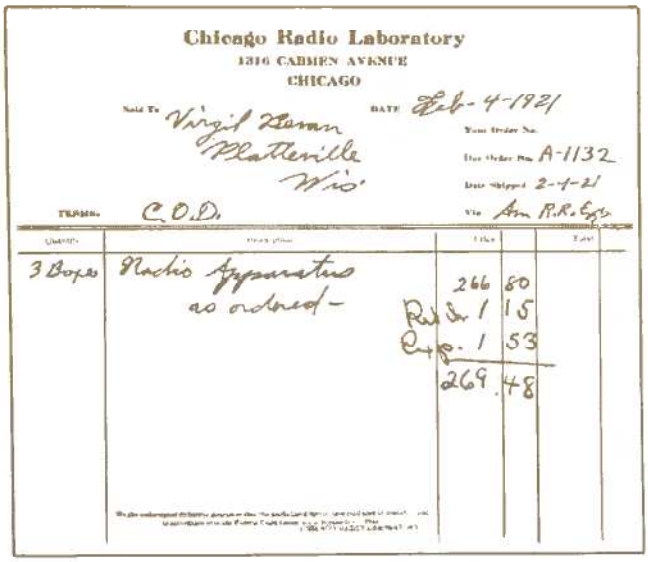
This original 1919 Z-Nith receiver, installed at station 9ZN, was the forebear of a long line of Zenith radios.



Sending-receiving tower of N. C. & St. L. railroad radio, Guntersville, Ala.

that Marconi's toy was a very useful and practical communications tool. Broadcasting began in earnest.

Hassel and Mathews quickly put on the market a receiver with which the general public could hear the growing number of broadcasts. Business boomed, and within a few months the walls of Chicago Radio Laboratory's new factory were bulging. So the company moved to a mammoth 3,000 square foot plant on Ravenswood Avenue, with a staggering rental of $300 per month, and a payroll of six employees. At this time the boys bought their first power tool, a motor-driven drill press, and boomed production to more than one set a day.

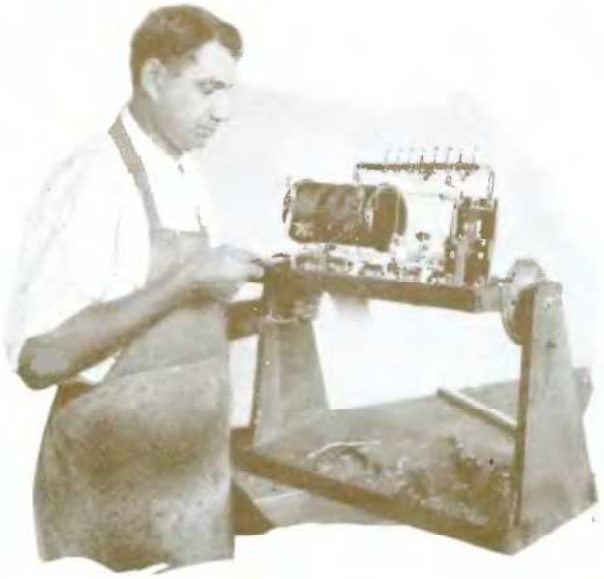


Chicago Radio Laboratory
1316 CARMEN AVENUE
CHICAGO

Sold To: Virgil Hansen, Platteville, Wis.
DATE: Feb-4-1921
Your Order No.
Our Order No. A-1132
Date Shipped 2-4-21
TERMS: C.O.D.
Via: Am. R.R. Exp.

Quantity	Items	Price	Total
3 Boxes	Radio Apparatus as ordered -	266	80
	Rebate	1	15
	Exp.	1	53
		269	48

Late-at-night paper work by partners resulted in this terse invoice for 1921 Z-Nith radio equipment.



Before development of assembly line methods, sets were built one at a time. 1922 Chicago Radio Laboratory, Kedzie Ave. factory scene.

McDONALD JOINS THE PARTNERSHIP

In the meantime, E. F. McDonald, Jr., of Syracuse, N. Y., had established himself in the automobile business in Chicago, where he introduced the first successful plan for selling automobiles on time payments; had served through the war in Naval Intelligence and been discharged with the rank of Lieutenant-Commander; and was looking around for a new business.

On New Year's Eve, 1920, McDonald went to a garage to pick up his automobile, and noticed several men listening to music coming from a box. He asked the proprietor what there was about this phonograph to make people listen to it on New Year's Eve.

"That is no phonograph," he was told. "That is a radio. They are listening to music through the air from Pittsburgh."

In 1924, burgeoning Zenith moved to this factory at 3620 Iron Street.

McDonald learned that it would take several months to get delivery on a radio set for himself. and decided he had found his new business for which he had been searching since the end of the war. However, it was not that simple. He found out that he would need a license to use the inventions of Major E. H. Armstrong, and Armstrong licenses were no longer available.

Temporarily balked, McDonald soon heard about two young men – Hassel and Mathews – who were building radio receivers on Chicago's north side.

Thinking about that radio set, he paid a visit to the Ravenswood factory and took particular fancy to a set that sold for $75.00, less tubes, batteries, and headphones. Hassel, in person, came to McDonald's residence

Comdr. Eugene F. McDonald, Jr., spearheaded organization of the NAB, and served as first president. At a meeting in the Drake Hotel, Chicago, April 23, 1923, were (left to right): Raymond Walker; C. H. Anderson; Frank W. Elliott, WHO Des Moines, later an NAB president; McDonald; Paul Klugh, manager of WJAZ; William S. Hedges, radio editor of the *Chicago Daily News*, then operating WMAQ; Elliott Jenkins, WDAP Chicago (now WGN); A. B. Cooper; John Shepard, 3rd; Powel Crosley, Jr., WLW Cincinnati.

at the Illinois Athletic Club to install it—and didn't leave until he had collected his money. Recalling the occasion, Hassel said, "It wasn't a question of whether I trusted him or not—we needed the money to keep going."

Hassel and Mathews had the all-important Armstrong license, and more business than they could handle with the equipment they owned. But they were short on capital. McDonald joined forces with them, provided funds for expansion, and became general manager of Chicago Radio Laboratory. One of his first moves was to change the trade mark from Z-Nith to Zenith.

When negotiations began, Hassel and Mathews were represented by a young Chicago attorney named Irving

Comdr. Donald B. MacMillan (left) was "amazed" by the "Microspeaker-phone" at demonstration by NAB president McDonald.

Herriott. Hassel told McDonald that he, too, should have an attorney.

"I like the cut of Herriott's 'jib,' " McDonald replied. "Let him represent us both." So began Mr. Herriott's long period of distinguished service as Zenith's general counsel, which continued until his death on November 17, 1953.

Normally, capital investment in an existing business results in an equity for the investor. In this case, however, the largest investor, McDonald, owned no interest whatsoever in Chicago Radio Laboratory, and for a very good reason. The Armstrong license was held by Chicago Radio Laboratory, a co-partnership, and was not transferable. This also had its bearing on the organization of Zenith Radio Corporation. When the company was formed in 1923 it was not a manufacturer. Instead, it was the exclusive sales and marketing organization for handling the radio equipment built by Chicago Radio Laboratory. This arrangement continued until other developments made a consolidation possible, at which time the entire assets and business of Chicago Radio Laboratory were acquired and Zenith became a manufacturer in its own name.

McDonald's financial backing and business know-how added impetus to the rapidly growing volume of business. In 1922 the factory was moved to larger quarters at 48th and Kedzie.

RADIO LEARNS TO SELL

Meantime, part of the company activities had gone back to the old radio shack near the Edgewater Beach Hotel. Mathews, Hassel and the engineers built a broadcast transmitter and installed it there under the call letters WJAZ. Studios were in the hotel itself, and "QSL" cards began to come in from listeners all over the nation.

Nineteen-twenty-three was an exciting year. Commander McDonald organized and became the first president of the National Association of Broadcasters. At this time nobody had a very clear idea of how radio broadcasting could be financed, but thoughtful Americans did not relish the idea of a government monopoly such as

From Chicago to the Arctic, Comdr. McDonald broadcast the news over WJAZ for members of MacMillan's 1923 expedition.

grew up in most foreign countries. McDonald provided and demonstrated the answer.

The publisher of a radio magazine for amateurs had greatly increased his print order one month in anticipation of absorbing another magazine. The merger fell through, and he was left with a staggering surplus of unsaleable magazines. McDonald asked him if he would donate $1,000 to the National Association of Broadcasters if they could sell these magazines over the air. He agreed.

Magazines were spotted in the few cities which at that time had broadcasting stations, and whose owners dared try this unorthodox scheme. Some broadcasters refused to participate. For three nights announcers on participating stations including Zenith's Station WJAZ read selected articles from the magazine, and told listeners that copies could be obtained from newsstands. The issue sold out, 100%. The publisher was delighted and continued the arrangement.

So far as can be determined, that was the first regular merchandising program conducted over a group of stations. It launched the system of sponsored broadcasting which has given Americans the finest broadcast service in the world.

The first mobile radio station located site for WJAZ at Mt. Prospect, Ill.

In 1924 Zenith produced the world's first portable radio. Left, is Comdr. MacMillan with one of these early sets.

NORTH WITH MacMILLAN

It was also in 1923 that McDonald persuaded Commander Donald B. MacMillan, the Arctic explorer, to take radio with him to the Arctic. When MacMillan sailed that summer his ship, the *Bowdoin*, was equipped with Zenith short wave transmitting and receiving equipment. For the benefit of the expedition WJAZ set up special news programs, and transmitting messages from friends and families of men in the expedition.

Broadcasts from WJAZ were picked up directly by the *Bowdoin*. Return messages came by short wave, frequently relayed by cooperative youngsters from all parts of the country, who covered phenomenal distances with their low-powered short wave equipment. This demonstration of short wave efficiency did not go unnoticed at Zenith, although at that time most radio interests believed that short wave had no commercial value.

Zenith sold this WJAZ transmitter to the Edgewater Beach Hotel in 1924, but this did not mean the end of Zenith's broadcasting activities.

The company retained the call letters WJAZ, and constructed what was probably the first mobile radio broadcasting station. It was first used to locate a new station site in Mt. Prospect, Illinois, 20 miles northwest of downtown Chicago. In 1925 this truck went all over the nation for the purpose of publicizing both Zenith and the new, highly efficient art of broadcasting. One broadcast was made from the summit of Pikes Peak.

In 1924, for the fourth time in five years, the company was compelled to find larger quarters. This time it moved to a four-story building at 3620 South Iron Street in Chicago. Hassel invented a new receiver with greatly

Original Chicago Radio Laboratory partner Karl E. Hassel, now secretary of the corporation and assistant vice president, engineering, has witnessed Zenith's growth from kitchen table days.

simplified tuning which did not infringe on Armstrong patents.

Zenith Radio Corporation then became a manufacturer in its own right, and marketed the receiver under the name Super-Zenith. It was an outstanding commercial success.

The same year saw introduction of the first portable radio, a suitcase-like affair with built-in loop antenna and horn type loudspeaker that sold for $200. (It is a measure of radio's progress that in little more than ten years Zenith built and sold a better portable for $19.95.)

SHORTWAVE FOR THE NAVY

1925 was another exciting year in which Zenith made notable commercial progress and exerted a profound influence on the future of communications and the development of American broadcasting.

At that time radio equipment on naval and merchant vessels the world over was long wave. It covered good distance at night, but during the day even powerful stations were out of touch with other ships and with shore stations at distances of only a few hundred miles. Nevertheless, the experts disdained short wave radio, which had been assigned to amateurs as a plaything.

This was the year the U. S. Fleet had scheduled a goodwill tour to New Zealand, Tasmania and Australia. It was also the year that Commander McDonald was scheduled to go north on the MacMillan-National Geographic Arctic Expedition.

McDonald persuaded Admiral Ridley McLean to put shortwave radio to the test by commissioning a young amateur, Fred Schnell (who later served in the World War II Navy as a Captain), and sending him along on the cruise aboard the *U.S.S. Seattle,* flagship of the fleet.

That settled, McDonald turned his attention toward the new MacMillan expedition. He selected the *S.S. Peary,* a sturdy 160 foot ship, equipped it with Zenith shortwave transmitting and receiving gear. When the MacMillan-National Geographic Expedition headed north in the spring of 1925, McDonald was skipper of the *Peary,* and second in command of the expedition, in charge of the naval aviation personnel that had been assigned to the expedition by President Coolidge.

When the expedition sailed, it left behind the heavy, long wave transmitting and receiving equipment that had been supplied by the Navy, for the simple reason that this gear could not provide long distance communication during the continuous daylight of the Arctic summer.

From the Arctic to Tasmania, singing eskimos provided dramatic evidence of short wave radio's potential for the world's navies. This experiment by McDonald (right) led the way in opening up once "useless" radio frequencies. MacMillan is seated at right.

In 1926, the first commercially produced set to operate on AC household current came from Zenith. It freed radio of cumbersome batteries.

But as they neared Nova Scotia they were overhauled by a fast destroyer, pulled into Sydney, and ordered to install the useless equipment as protection for the naval personnel on the expedition. This long wave radio gear did not send or receive a single message while in the Arctic. It couldn't span the long distances involved during the 24-hour Arctic daylight.

Short wave, however, soon gave dramatic proof of its value. Putting in at Disko Island to refuel, McDonald was told by the local Danish governor that permission would have to be received from the Danish Minister in Washington. He regretted that their long wave radio transmitter could not get a message out in daylight, but could do nothing about it until night fell. This was in June, and night would not come until September.

McDonald needed coal, so he turned to his short wave rig, and enlisted the services of an amateur radio operator near Washington. Four hours later he had his permission from the Danish Minister.

In the meantime the U. S. Navy Fleet was on its way across the Pacific. With his short wave "pin box radio" Schnell kept direct contact with American amateurs long after the Fleet's high-powered, long wave equipment had lost daytime contact. He also communicated directly with the *Peary,* as it sailed north toward Greenland.

The MacMillan expedition reached Etah, Greenland, only eleven degrees from the North Pole, while the *U.S.S. Seattle* was off the coast of Tasmania, 12,000 miles away. The Fleet's long wave equipment could not even maintain direct contact with the American continent at this great distance. But Schnell communicated directly by short wave, not only with American amateurs, but with the MacMillan Expedition as well. McDonald clinched the demonstration by putting a group of Eskimo singers before the mike, and sending their voices to Admiral Coontz on the *Seattle,* almost exactly half the world away.

That was the start of practical use of short wave radio by the U. S. Navy. The navies and merchant marines of the world soon followed.

It is interesting to note that ALL of radio's expansion into new channels since that date — international communications, ship to shore, VHF and UHF television, radar, etc. — has been in this once "useless" wave band of 200 meters and less.

CREATION OF FEDERAL RADIO COMMISSION

In 1925 there existed a one-man control of radio with the Secretary of Commerce as supreme czar. McDonald said to then Secretary Herbert Hoover that he did not believe the law was sound. On the invitation of Mr. Hoover, who said he would welcome a test case, McDonald violated a Department of Commerce order and broadcast on a Canadian wavelength.

The Department brought an action against Zenith, and against McDonald personally. Zenith went into court with the contention that the radio law of 1912 was out of date in 1926. Zenith won.

Congress then passed a law establishing the Federal Radio Commission (what is now FCC) which made it possible to minimize the growing interference between stations on the same wave length. Zenith officials took a leading part in helping to frame and pass the new law. So ended one-man control of radio.

FIRST AC SETS

In 1926 came one of the most important milestones in radio set history, another Zenith First. Up to that time home radios operated on heavy storage batteries, dry batteries, or a combination of both. Zenith developed and put on the market the first home receiver that operated directly from regular AC electric current. For most homes this meant the end of cumbersome and messy batteries, and made radio safe for the living room rug. That marked the transition of radio from tinkerer's toy to a standard household necessity.

Zenith equipped the first train to use short wave radio. Above is the New York Central antenna installation. G. E. Gustafson (left), the young engineer who built and installed the equipment, has been chief engineer since 1934 and vice president in charge of engineering since 1943. Below is view of caboose before test run.

Another Zenith First of 1926 turned out to be the better mouse trap that the world did not beat a path to. It was the first railroad train in the world equipped with shortwave (70 meters) radio communications, a New York Central special of twelve cars that pulled out of Elkhart, Indiana on June 11, and made the 100 mile run to Englewood, Illinois with all communications between cab and caboose conducted by radio.

The equipment was designed and installed by G. E. Gustafson, a young Zenith engineer, who is now vice-president in charge of engineering. He started from scratch in development of suitable antenna, signalling systems to call the crew at either end, methods of preventing road noises from getting into the mikes, etc.

The October, 1927 issue of Proceedings of the Institute of Radio Engineers reported, "No difficulty was had in maintaining two-way conversation between the caboose and the locomotive when standing still or when running at top speed. The engineer was able to hear and understand everything coming from the loudspeaker behind his head without diverting his attention from the road ahead... all train orders were given by means of the radio installation . . . the train was stopped and the engine uncoupled from the train and run ahead under orders given entirely by radio from the caboose . . . communication was maintained with loudspeaker operation at both ends up to a distance of four miles . . ."

There was an official demonstration on July 8, with a 116 car freight train carrying passenger car and caboose filled with newspaper men and radio and railroad officials. It made the run from Englewood to Elkhart with all communications between cab and caboose by radio.

Results of the official test were entirely satisfactory, and radio transmission of signals saved the delays that ordinarily occur when a train man walks the entire length of the train.

Zenith did not go into the railroad radio business because the limited market did not justify the heavy expense involved, and because of the Management's conviction

King Alexander I of Jugoslavia astounded court officials with a 1929 Zenith "Spanish Deluxe" receiver.

A Zenith "first" in 1927 was automatic pushbutton tuning.

that Zenith's future lay in mass production of radionic equipment for the public.

The idea did not take hold at the time, partly because of the shortage of radio frequencies, and partly because the idea was not vigorously promoted.

Development of FM, and expansion of radio into the shorter wave spectrum, have led to extensive use of radio by railroads in recent years. Some major railroads now have their crack trains equipped with radio to communicate between cab and the rest of the train, and between the train and land stations. Some are even using radio to provide a link for passenger use from moving trains to the long distance telephone.

THE LATE TWENTIES

By 1927 the radio manufacturing industry encompassed a helter-skelter of many brand names, most of which have long since disappeared, and radios had wide variation in quality and performance. Zenith, which already possessed an outstanding reputation, placed even greater emphasis on superior quality and engineering innovations, and on merchandising these features. The company's advertising employed such slogans as "The Quality Goes in Before the Name Goes On," "Known the World Over," and "World's Largest Manufacturer of High Grade Radio."

Through most of 1927 Zenith continued to be the only manufacturer producing all-electric AC sets. To this feature was added automatic push button tuning, which enabled the user to select any of nine stations by simply pushing the appropriate button.

The company was really beginning to roll. Net profits, which had been a tidy little $34,000 in 1924, were $224,000 for the fiscal year ended June 30, 1927.

In the next year Zenith moved into high gear. The company offered a line of all-electric sets, many with automatic tuning, which sold in a price range from $100 to $2,500. Net profit for the ten months ended April 30, 1928, was $728,000. In the following year the earnings broke the million dollar mark with a thumping $1,110,000.

Foot switch for changing stations was a Zenith car radio tuning advance. It followed earlier innovations like the steering column tuning control.

One interesting highlight of 1929 was the production of a custom-built radio for King Alexander I of Jugoslavia. A special emissary of the King called. He said he had been turned down by radio manufacturers in New York who thought he was pulling a gag, and that he wanted to purchase a special radio set for His Majesty. He came out to the factory in formal attire, with a ribbon across his chest, and placed the order.

The set was housed in one of Zenith's most ornate cabinets. It included Zenith's finest long wave and short wave chassis, plus a remote control with 75 foot cord. The King had a wonderful time with it. At one party he confounded his generals by switching from station to station, short wave to long wave, with the remote control. They thought it was pure magic.

The King was so pleased with the set that he gave Zenith an order to supply radios for the Jugoslavian school system.

The outlook for business seemed rosy in these last months of "the era of wonderful nonsense." Then came the market crash of October, 1929, and the depression years that followed. All business suffered severely; the young radio industry was thrown into virtual chaos.

THE DEPRESSION YEARS

Zenith retrenched savagely. The Michigan Avenue offices were shut fast, and all operations were consolidated in the plant at Iron Street. Product planning was regeared to meet the times. Large sets were replaced in the line by smaller, lower-priced models, but the emphasis on quality was not relaxed. Employees, imbued with fierce pride and loyalty, tightened their belts along with management.

Zenith forged its way through five years of losses without borrowing and emerged from the depression with meteoric speed.

The company reported sales of about $8½ million in the 1935-36 fiscal year. The following year they were almost double that amount. And Zenith's report for the year ending April, 1942 revealed a sales total of some $34 million.

That recovery was made possible by foresight, conservative management, business drive, and inventiveness. Much of the credit for Zenith's weathering the storm and making its meteoric post-depression recovery is due to Hugh Robertson, who joined the company in 1924, became treasurer in 1926, and took the post of executive vice-president in 1934.

Hugh Robertson, executive vice president since 1934, joined Zenith in 1923, became treasurer in 1926.

Among Zenith's depression weapons was a new line of low priced table model receivers introduced in 1931. These sold in great volume. Another was a 110 volt DC radio operating directly from the electric line. This model was very popular in such cities as New York and Chi-

Harnessing wind throughout the world, Wincharger installations like this one in Iceland brought electricity to remote areas.

cago, where large areas still had direct current, particularly in business and apartment hotel districts.

It was in the depression year of 1931 that the Phonevision idea was born. Commander McDonald, convinced even then that advertising sponsorship alone could not provide the kind of television programming the public would demand, urged other radio manufacturers to work on the problem of providing television with a home box office. Zenith laboratories began their first research at that time on developing the technical means for providing a home box office.

ECONOMIC UPTURN

The economic turn for Zenith began in 1933. Deficits had been running at the rate of half a million dollars a year, but there was a fifty-thousand dollar profit for the year ended April 30, 1934.

At the beginning of the year 1934, Zenith was the lowest priced radio stock quoted on the New York Stock Exchange. At the end of the year it was the highest.

In 1934, Zenith introduced an auto radio which had the tuning control on the steering column in easy reach of the driver. In subsequent years Zenith became one of the largest suppliers of automobile radios to the industry.

Zenith's financial recovery assumed spectacular proportions in 1935 when net earnings pushed through the million dollar mark again to a total of $1,213,000 for the year ended April 30, 1936.

FREE POWER FROM THE WIND

One of Zenith's recovery tools was a legacy from McDonald's voyages to the Arctic. Along the route he had presented radio receivers to a number of missionaries and government officials, with what he believed to be an ample supply of batteries. But he had forgotten the loneliness of the six month long Arctic night, when these remote spots were completely out of touch with civilization. Radio was like a new breath of life to these isolated people, bringing them news and entertainment from all over the world. As a consequence, supplies of batteries that should have served for three years were exhausted in less than one.

McDonald did the best he could for his Arctic friends by sending them new batteries as needed. At the same time he began wondering if there were not some other method of supplying them with dependable power. One day while sailing a boat it occurred to him that the one great source of power that was available almost everywhere was the wind.

In 1935, with major depression problems solved, he asked Zenith engineers to find out if there was in existence a practical device for translating free power of the wind into electricity.

Within 24 hours the engineers reported back that there were two Iowa farm boys, John and Gerhard Albers, who were associated with the Wincharger Corporation in Sioux City, which was building wind driven generators for charging 6-volt storage batteries. They had solved the problem of getting their generators to work in light winds by using two airfoil sections for blades on their "wind mill." The wind *pulled* these airfoils around, as compared to the way wind *pushed* the multitude of blades on the low-speed windmills used for farm water pumps.

The Albers boys had done all of their development work without the aid of wind tunnels. Instead, they

Early Wincharger development work used on automobile instead of wind tunnels for testing.

A tremendous sales feature introduced in 1935 was the "big, black dial." Shown with giant Stratosphere receiver is Irene Hervey.

mounted Winchargers on automobiles; on calm days, the speedometer reading gave them the wind velocity.

Zenith, meanwhile, had developed an efficient battery radio that operated on a single 6-volt storage battery, without need for bulky, expensive B and C batteries. When used together, this radio and the Wincharger unit could provide unfailing radio operation, with a total power cost of about fifty cents a year. Moreover, it had enough reserve power to operate a few lights from the storage battery, a Godsend to farms that had no electricity.

Zenith bought control of Wincharger, which then acquired a larger factory in Sioux City, and started mass production. The first order from Zenith to Wincharger called for fifty thousand units.

The 6-volt Wincharger was sold for $10 to purchasers of Zenith radios who wanted the power unit. It was an outstanding commercial success. Sales were counted in tens of thousands, and since each $10 Wincharger sale usually resulted in the sale of a Zenith radio, the company soon became the industry's leading supplier of farm radios.

Wincharger's next development was a 32-volt generator for farm lighting plants. Thousands of these were sold as replacements for the gas engine generators used in farm lighting plants, which were very costly to operate. Other thousands were sold, together with batteries and controls, to supply a complete unit for providing farms with light and enough power to operate cream separators, refrigerators, washing machines, etc. These outfits were so efficient that one of the larger models would provide 250 kilowatt hours per month with an average wind velocity of 10 miles per hour.

The unfailing dependability of Wincharger power soon made the company known all over the world. Anybody traveling through Canada, Alaska, South Africa, South America, the Alps, almost anywhere that men live beyond the reach of power lines, will come across these devices, merrily whirling away to provide free power from the wind. Travelers throughout the vast reaches of the remote Arctic regions see them there, supplying light and power in the very land where the idea for them originated.

No measure can ever be put upon the contribution Wincharger made to better, more comfortable living for rural America and throughout the world. All told, Wincharger brought the blessing of electricity to more than half a million isolated homes.

In 1937 Zenith purchased all outstanding stock to make Wincharger a wholly owned subsidiary.

A NEW LOOK

Preoccupation with the development of Wincharger did not prevent Zenith from making major progress in other lines. One 1935 innovation was as simple and obvious as the eraser on a pencil, but it had been completely overlooked by the entire industry.

Prior to 1935, the dials on all makes of radio receivers were small and difficult to read. Zenith changed all this by adding to its 1935 line a large, black dial, with figures so distinct that they were easily read even without glasses by most people. This dial became a tremendous sales

This plaque presented to management in 1936, symbolizes spirit of employee loyalty that has become a Zenith tradition.

feature, and was widely copied by other manufacturers.

Even during the emphasis on low priced receivers in the depression years, Zenith had not forgotten its devotion to quality. Consequently, it found a ready market for its 1935 line of feature-laden receivers. One model, selling at $750, incorporated Zenith's largest chassis in a massive cabinet, with 50 watt audio output, variable selectivity, 3 speakers, and other exceptional features.

EMPLOYEE LOYALTY

When depression clouds began to lift, Commander McDonald called all employees together to personally thank them for the loyalty they had shown, and for the sacrifices they had made to help the company survive the depression years. He then promised them that henceforth they would share in the prosperity of the company. That promise was kept with a direct bonus plan which has been superseded by a profit sharing retirement plan.

In 1936 company employees surprised the management by the presentation of a bronze plaque which read:

TO THE
DIRECTORS AND OFFICERS
of the
ZENITH RADIO CORPORATION
We believe in your wisdom
and fairness.
We assure you of our loyalty and effort.
We are proud of this partnership.
THE EMPLOYEES
of the
ZENITH RADIO CORPORATION
December 1936

In 1937 Zenith had completely outgrown its Iron Street factory, and purchased a large building at 6001 West Dickens Avenue, with 392,458 square feet of floor space, and another 225,000 square feet of unoccupied land. The factory was completely renovated and equipped with the most modern production equipment available, to make it one of the most efficient production units in the radio industry.

The "Radio Nurse" applied Radionics to baby-sitting in 1937.

Comdr. McDonald tunes a chairside radio-phonograph, a Zenith "First."

PRE-WAR DEVELOPMENTS

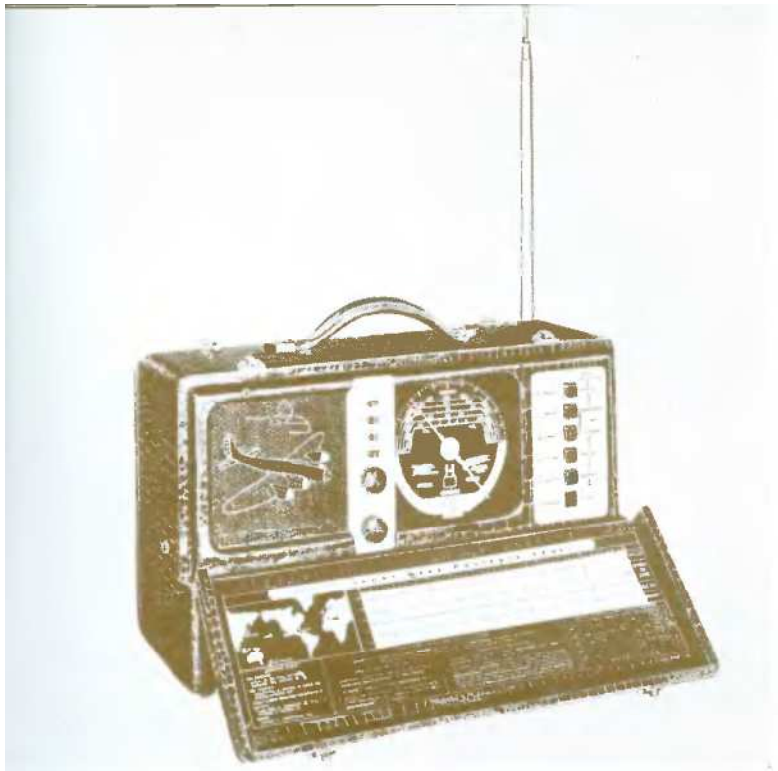
The ensuing years were marked by steady progress. In 1937, for example, the radio industry as a whole showed a 15% drop in sales, but Zenith sales increased. New developments prior to American entry into World War II included a new chairside radio phonograph combination, a Radio Nurse which permitted nurse or parents in one room to hear every sound from the baby's room, and a line of portables that catapulted Zenith to its position of unchallenged supremacy in this field.

A RADIO HEADLINER

An outstanding feature of Zenith portables was the detachable Wavemagnet® antenna that could be attached to the windows of planes, trains, or steel buildings to give good reception in these difficult locations.

Headline star of the portable radio field was the Trans-Oceanic® short-wave, long-wave portable which was put into mass production some months before the factory converted 100% to war production. This set had been several years in the making before it went into production, and has been thoroughly field tested in every type of climate from the Arctic to the Tropics.

When civilian production stopped, Zenith had unfilled orders on hand for more than one hundred thousand Trans-Oceanic portables. It was unable to fill these, but tens of thousands had already been produced and shipped. These sets were carried to every war theater by American soldiers and officials, and earned a reputation for outstanding performance and rugged durability that has never been approached by any other portable



Thousands of orders for this 1941 Trans-Oceanic portable radio had to remain unfilled when Zenith converted 100% to war work.

A world leader, this 1955 Trans-Oceanic radio surpasses all preceding models in features and world-wide performance.

radio receiver. Some of the reports the company received about the Trans-Oceanic radio are almost unbelievable; sets that were fished out of water-filled shell holes, dried in the sun, and put into service; sets that were blasted by bombs and still worked, etc., etc. In many locations around the world the Trans-Oceanic portable proved to be the only radio receiver that could give dependable reception of American and other short wave programs. For thousands of our soldiers this radio was for long periods of time the only source of direct news from home.

Demand for the Trans-Oceanic portable became enormous, and sets commanded fantastic prices on the black market, because none was to be had through regular commercial channels. Zenith, of course, sold none, but the management had kept a small inventory. These sets were presented, from time to time, to American ambassadors. and to other officials who had urgent need for them. It was a favorite saying around the plant that there were two things at Zenith money could not buy: Zenith friendship and Trans-Oceanic portables.

ZENITH ENTERS FM AND TV BROADCASTING

Shortly after establishment of radio networks in 1926. Zenith concluded that there were enough broadcast programs on the air to satisfy public need, and accordingly disposed of station WJAZ. However, the loom of television and the development of FM in the late 1930's made it advisable from an engineering standpoint for the company to re-enter the broadcasting field.

February 2, 1939, Zenith went on the air with W9XZV, the nation's first all-electronic television station built to then-current standards. For nearly three years this was the only television station operating in Chicago.

The station operated three nights, Monday, Wednes-

A World War II veteran, the Trans-Oceanic portable again saw front line service during the Korean conflict.

Outside Casablanca, Morocco, the famed Trans-Oceanic portable provides entertainment for U. S. airmen.

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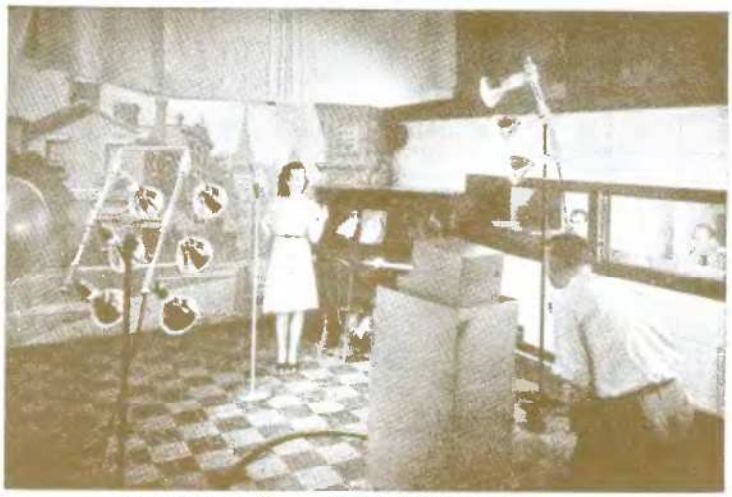
day, and Friday, from 7 until 10 P.M. and from 12:00 Noon to 1:00 P.M. Monday through Friday. One of the purposes of the noon programs was to project a picture which Zenith and other Chicago manufacturers could and would use to test their receiver designs. In those days there was no other broadcast or test signal which could be used to determine whether a receiver would work when installed or repaired.

Programs included both motion pictures and live productions. Many prominent entertainers of that era and some who are headliners today appeared on the station. They included Pat Buttram, Tommy Bartlett, Les Tremaine, Dinning Sisters, The Vagabonds, Tom Moore and Eddie and Fanny Cavanaugh. Burr Tillstrom's popular puppet show, now known as Kukla, Fran and Ollie, made its television debut over Zenith's W9XZV.

One of the most successful programs on the station at that time was a show called "Time On Television," which Zenith produced in cooperation with the editors of TIME magazine and the editors of THE MARCH OF TIME. It consisted of a 45 minute weekly news broadcast on Wednesday night, involving the cover picture and excerpts from the magazine which would appear on newsstands the following day.

During the war, at the request of the FCC, W9XZV broadcast the world premiere of the motion picture "Patrolling the Ether," an MGM production. Post-war the station continued to operate from the factory location until it was moved to the Field Building in 1950. There, under new call letters, K2XBS, it broadcast the Phonevision test, and later proved invaluable to the television industry during development of the NTSC system of color television.

In the late 1930's, Major E. H. Armstrong perfected his static and interference free system of FM broadcasting to the point where the FCC set aside certain channels for its development. On February 2, 1940, Zenith's FM station, W9XEN, went on the air from studios in the factory. It was the first FM station in the midwest, and second or third in the country.



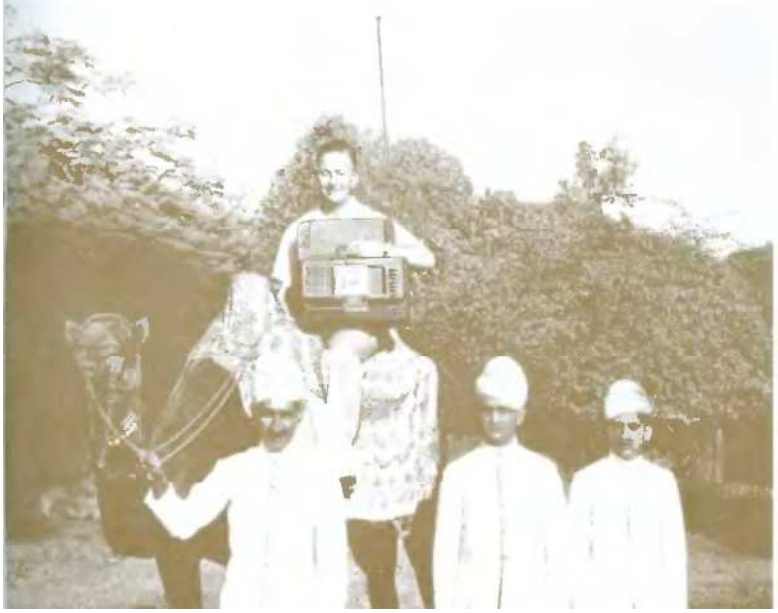
A studio scene from a 1939 W9XZV telecast.

The transmitter was moved to its present location on top of the Field Building in Chicago's Loop on February 27, 1941. Its power was increased to 50 KW, making it the most powerful FM transmitter in the country. Programming was confined to music, predominantly symphonic in nature, but with semi-classical segments arranged to meet the desires of particular listener groups.

These programs have been continuously utilized over the years by various schools and musical study groups for educational purposes. The FM stations operated by the University of Wisconsin and Purdue University have rebroadcast WEFM programs for educational and cultural purposes.

The station has also been instrumental in engineering development of recording and receiver test programs. One special project resulted in development of the Cobra® tone arm, a device which caused something of a revolution in the use of the recording arm at radio stations throughout the country and which helped pave

Astride a camel in Pakistan, Captain Ransom Fullinwider, USN, is shown with his Trans-Oceanic model that has circled the globe.



In the French Cameroons, West Africa, voices and music brought in by a Trans-Oceanic radio were all a group of natives asked in return for work for a touring Hollander, Mr. Taco van Tijn of Amsterdam.

First with FM in the Midwest, WYXZR, now WEFM, set the pace for FM broadcasting. It is now the nation's oldest FM station.

The world premiere of the motion picture "Patrolling the Ether" was broadcast by Zenith's television station at the request of the FCC.

the way toward high fidelity reproduction of recorded music. Such engineering projects are continuously seeking to improve the quality of the broadcast signal and the characteristics of home FM receivers.

In 1953 WEFM was the first station in the Chicago area to broadcast a high fidelity signal spanning the range between 20 and 20,000 cycles per second. This range accommodates every frequency available on the best high fidelity recordings. Its station's current music library of some 200,000 titles represents practically complete replacement of all prior records with new high fidelity recordings since July, 1953.

Today, WEFM is the nation's oldest FM station.

Since its inception, WEFM has been operated as a public service without the sale of advertising commercials. It has won incalculable good will for Zenith, and is today recognized as one of the finest high-fidelity broadcasting stations in the world.

THE WAR YEARS

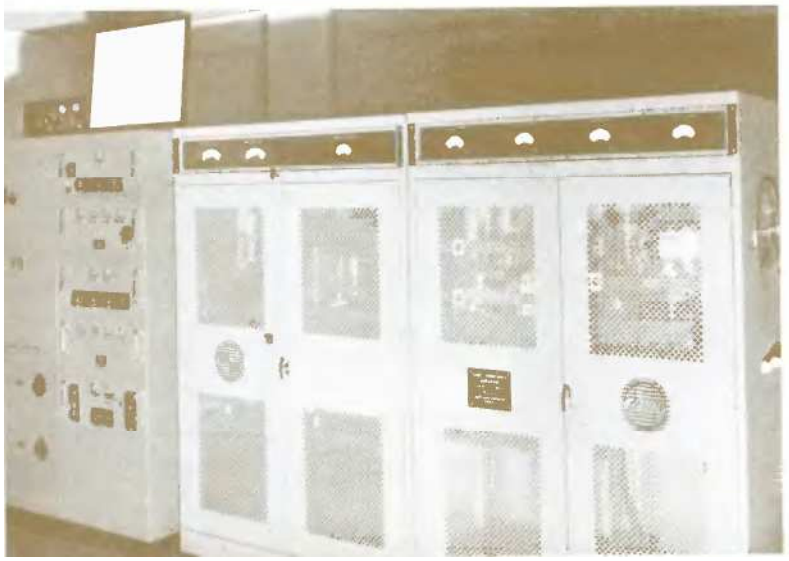
One of the brighter pages of Zenith history is the record for patriotism and efficiency it established during the war.

An outstanding example is the company's attitude toward the Government in regard to patents. In October, 1941, Major Donald Lippincott called upon Commander McDonald to discuss the legal difficulties in regard to radio patents that had followed World War I, and to ask his thoughts on the establishment of some sort of industry-wide blanket license to the Government.

McDonald replied that the next war would be fought and won before the industry could agree on such a license. Then he said that a patent was a legalized monopoly, and that he did not believe anybody had a right to assert a patent against the Government in time of war. He suggested that Major Lippincott sound out other manufacturers on the idea, and in the meantime offered the Government a free license for the war period to all patents held by Zenith or Wincharger. His suggestion was adopted, and with only a few exceptions all other holders of radio patents granted the Government the same free license.

In April, 1942, long before there was any talk of renegotiation of war contracts, Zenith directors passed a resolution that Zenith would follow the policy of voluntarily returning to the Government any amounts that it

Zenith's FM transmitter was installed in the Field Building in 1941.



High fidelity demonstrations in this studio at 333 North Michigan Ave. Display Salon utilize WEFM broadcasts.

The Honor Roll of men and women of Zenith who served in World War II and Korea.

considered to be over and above a reasonable profit from war business.

Zenith's voluntary refunds aggregated millions of dollars before the Renegotiation Act went into effect.

During the war Zenith developed many short cuts in the production of war material. In spite of the fact that some of these could, post-war, become valuable production secrets, they were freely shared with other manufacturers.

Zenith's war production ranged from radar to communications equipment. Much of the information is still classified, but some has been released by the Government.

Early in the war Zenith was asked to mass produce a

Last Trans-Oceanic before Zenith's 100% conversion to war work was put through its paces by Comdr. McDonald.

frequency meter that had been developed as a hand-built instrument of fantastic accuracy and sensitivity. Its purpose was to insure identical, matching frequencies on the radio equipment of, for example, *all* the bombers that went on a particular raid. Because it would be used all over the world, it had to maintain its accuracy anywhere from the frigid Arctic to blistering deserts and sweltering tropic jungles.

Zenith was one of several manufacturers to be given contracts, but Zenith was the only mass manufacturer that at first produced these meters to the Government prescribed tolerances. Because production was essential, standards were relaxed for some manufacturers, and Zenith was offered the same latitude. The Zenith management declined to slacken quality and lower standards, and instead offered to make its production methods freely available to all other producers.

Another outstanding war achievement was Zenith's contribution to the V-T proximity fuze for bombs, a device that shared priority with the "A" bomb. This was a fuze designed to set off the bomb at a predetermined distance from the target.

Early in the war Zenith had developed a proximity fuze for rockets, but it did not get into production because suitable rockets did not become available.

Meantime, research on bomb fuzes had bogged down, and Zenith was asked to undertake the project late in 1943. Within six weeks, Zenith physicists and engineers had solved the major technical problems involved, and developed new and better circuits. By the end of 1944, a pilot production line was in operation. For months before the Japanese surrender Zenith was in heavy production of these fuzes, which were shipped out by air for the final assault on Japan.

The V-T fuze was one of the best kept secrets of the war. Although Zenith produced and shipped thousands and thousands of these devices, the workers on the production line never had an idea what they were building.

In July, 1945, Zenith received a letter from the Signal Corps, complimenting the company on producing ahead of schedule for seven consecutive months, during a period when the industry as a whole in this area was behind schedule. This was only one of a long series of commendatory letters received from Government agencies.

Zenith was awarded its first Army-Navy "E" on November 7, 1942. Other awards to a total of 5 followed in rapid succession.

Wincharger Corporation likewise had a brilliant war record. It was an outstanding producer of dynamotors, which are high voltage generators driven by motors that operate on the low voltage circuits of tanks, planes, etc. Like Zenith, Wincharger was a five-time winner of the Army-Navy "E".

Mass production of sensitive frequency meter was one of Zenith's major contributions to World War II.

Zenith proudly displayed its World War II Army-Navy E awards. The first came November 7, 1942.

THE HEARING AID CRUSADE

Zenith manufactured only one civilian product during the war years; the now famous hearing aid. This had been designed pre-war, and then put on the shelf for the duration. However, when the wartime shortage of manpower became acute, Zenith pointed to the labor pool of hard of hearing people who could not afford high prices for hearing aids. Priorities for hearing aid production were granted, and it went on the market in 1943.

Introduction of the first, complete, ready-to-wear Zenith hearing aid was phenomenally successful. Within months, this efficient, economical aid brought help to thousands who could not afford the high prices asked for other makes.

ATTACKS ON ZENITH

Strong opposition to Zenith's intention to lower the cost of hearing aids developed in the trade—

Stories were circulated, principally to prospective hearing aid purchasers, that Zenith had thrown together a cheap hearing aid, purely as a publicity stunt, and that Zenith would drop its instrument at the close of the war.

Certain competitive advertising indicated that no hearing aid sold over the counter could give satisfaction, since every individual had to be fitted with an aid to meet his individual requirements as determined by a professional consultant. Other ads stressed that "a hearing aid is more than a radio;" or—a hearing aid must be "tailor-made" not "ready-made;" or—"one hat won't fit ALL heads—and one hearing aid won't help all people to hear."

Designed for home and office use, the Ravox hearing aid operated on house current.

Further—complaints were directed to the Department of Justice that Zenith was selling hearing aids below cost for the purpose of wrecking the industry. McDonald and the late Irving Herriott, Zenith's general counsel, took the company's records to Washington for examination by the Department. The examination proved that Zenith was following sound, prudent business management in its hearing aid program and price structure.

Complaints were directed to the Federal Trade Commission and the Better Business Bureau about Zenith advertising and sales practices. Every allegation was disproved by Zenith to the entire satisfaction of each agency involved and Zenith stature grew.

Attempts were made to influence the American Medical Association to withhold from Zenith hearing aids its seal of acceptance. The efforts were futile.

Low-cost Zenith hearing aids enabled thousands of hard-of-hearing workers to join the ranks of war workers and ease the manpower shortage.

Electronic parts suppliers were urged to withhold material from Zenith. None complied, and Zenith soon became their largest hearing aid customer.

The result of all these attacks was to make Zenith stronger and build new friends for the company.

Recent introduction of the company's five tubeless all-transistor aids has helped to build public demand for Zenith instruments to an all-time high.

UHF BROADCASTING

As the peak period of war production passed in 1944, Zenith was looking toward the post-war development of television. Our engineers realized there could never be sufficient VHF channels for national television operation, so all design work was based on the supposition that UHF reception must be available for all receivers.

A new world of sound was opened for thousands when Zenith introduced low cost hearing aids. Contrasted with early instrument is the Royal "M" (lower left) put on the market in 1954.

In connection with this design work, our engineers felt that it was essential to have a UHF transmitter, in addition to the VHF transmitter on Channel 2.

In 1944 Zenith applied for an experimental UHF transmitter license which was granted in 1945. All transmitter and other equipment for this station was built in the Zenith laboratory and went on the air at the main plant in June, 1946, where it is still operating under the call letters KS2XBR.

FM

Pre-war Zenith was one of the few radio manufacturers that had mastered the technical intricacies of FM receivers. During the war it was decided that, post-war, FM's frequency should be changed from the 45-mc band to the 100-mc band. This move posed new problems for receiver manufacturers by requiring completely new manufacturing technics.

Zenith has always had the ability to regear rapidly. This was apparent in the post-war period, when the company was one of the first to attain volume production of civilian goods. It was particularly true in the FM receiver field, where Zenith produced 36% of the industry's entire output of FM receivers.

Meantime, in the closing days of the war, plans had been blueprinted for large scale expansion of production, engineering, and other facilities. Involving millions of dollars, millions of bricks, miles of production lines, and acres of ground, this expansion wave was to continue at an accelerated pace for nine years following the end of hostilities in Japan.

SUPPLY AND DEMAND

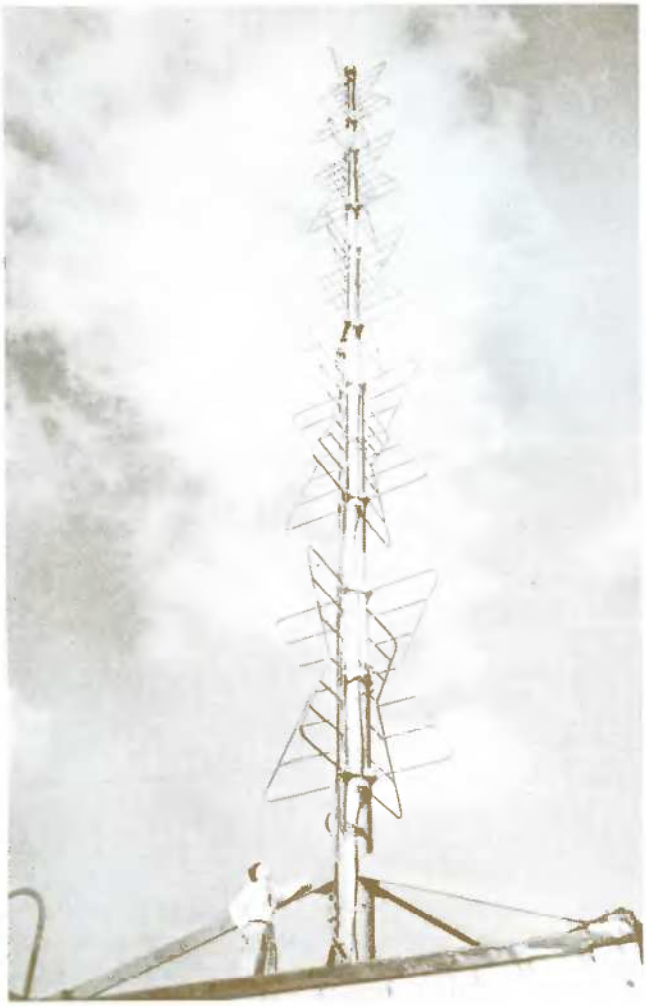
Immediately following the war, the supply of component parts became a grave problem for all manufacturers, Zenith among them. To relieve this situation, in 1945 the company plunged into the manufacture of its own components, loud speakers, record changers, coils, and other essential elements.

Associated developments came thick and fast. In 1946, a portion of table radio assembly and production was transferred to the Wincharger plant in Sioux City, Iowa, to make room for expansion within the Chicago plant. By the beginning of the following year, the company was in production with its famous Cobra phonograph tone arm and was preparing for public announcement of Phonevision.

PHONEVISION®

Actually, the idea of Phonevision was well established at Zenith when the company issued its announcement on the subject in 1947. Back in 1931, the company had started its investigations in the field of subscription television, motivated by the long range thought that television at some future time would reach the point where advertising revenues alone would not be able to support an adequate number of stations and the kind of programs the public would want. By July, 1947, the company's patent department authorized announcement that Zenith had succeeded in its search for a means to provide television with a boxoffice in the home. Details were released on a system which broadcast jittered pictures that could be cleared up only by a special decoding signal. In 1947 the name Phonevision was selected as a trade mark to identify Zenith's original system of subscription television.

Alexander Ellett (left), Zenith's vice president in charge of research, and Comdr. McDonald view scrambled and unscrambled TV picture during the 1951 Phonevision test.

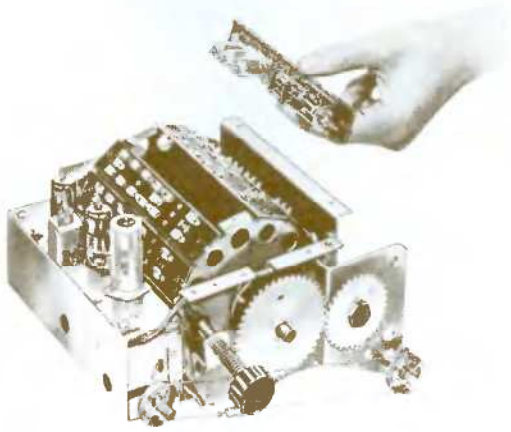


The mass audience Phonevision test was beamed from this Zenith TV antenna atop the Field Building in 1951.

Today, the name Phonevision also covers other improved Zenith systems such as the method tested in conjunction with WOR-TV in 1954, which utilized an airborne decoding signal instead of wire line decoding. Collections can be made by means of a coin box on the receiver, by monthly billing, or by the sale of coded cards. The basic fact about the necessity for subscription television was apparent to Zenith as far back as 1931, and became increasingly more apparent to people in general during the post-freeze period when TV stations started to experience financial pangs generated by advertising budgets too meager to provide for all stations.

ZENITH'S FIRST TV

In 1948 Zenith put its first line of television receivers on the market. With an eye to protecting its customers' investment in Zenith television sets, the company introduced an advanced type turret tuner which could be utilized for future UHF reception by the simple addition of tuning strips. The company urgently recommended



The first Zenith television sets produced in 1948 had provision for UHF reception with addition of tuning strips to advanced turret tuner.

that other manufacturers follow a similar course, a recommendation that went largely unheeded.

It was also in 1948 that the company's rapidly expanding manufacture of television receivers required the assurance of a continuing supply of picture tubes, and the Rauland Corporation, noted Chicago manufacturer of television tubes, became a wholly owned subsidiary. Zenith engineering, plus the excellent research facilities of Rauland, resulted in the first "black tube" television sets introduced to the public in 1949. These picture tubes established a new standard in television picture contrast.

PROFIT SHARING—RETIREMENT

In the same year, the company was also making news in the field of employee relations. Ever since the days when the company had climbed up out of the depths of the depression, Zenith had shared its earnings with its employees. But in 1949 profit sharing was put on new, solid footing. While many profit sharing and employee retirement plans are based in part on employee contributions, the Zenith plan found the company contributing 100% of the fund. By the end of 1953, contributions augmented by earned interest added up to more than $10,000,000. This fund is managed by a committee of Zenith employees, independent of management, and a separate trustee. Each employee's share is determined by his rate of pay and length of employment.

In 1950, the company took a step that was highly unusual in the radio manufacturing field. For a number of years, Zenith had manufactured an excellent automobile receiver, noted for its many features, reception radius, and tone qualities. Millions of Fords, Hudsons, Mercurys and Nashes had carried their passengers along with the companionship of a Zenith radio. But in 1950, in the face of an established success in the field, Zenith stopped making automobile radios. The reason was simple. Company manufacturing facilities were more sorely needed to meet the demand for Zenith television and home radio sets.

The 5 million dollar Kostner Ave. manufacturing plant was completed in 1953.

PLANT EXPANSION

This burgeoning market was reflected also in plant expansion. In 1950, the company acquired a manufacturing property at 1500 North Kostner Avenue, and immediately started reconversion of the plant to handle some of the heavier manufacturing processes. The primary intent was to provide housing for machining operations, speaker, and hearing aid manufacture. However, Zenith's share of Government orders made additions to the Kostner Avenue plant an almost immediate requirement. Early in 1951, ground was broken for a structure that more than doubled the original floor area, and out of this new section were to come tons of Zenith made equipment destined to help fight Communist aggression in Korea.

COBRA-MATIC® RECORD CHANGER

But domestic markets were also a major consideration. Company engineers were convinced that existing phonograph record changers left much to be desired, particularly in the area of record speed control. In 1950, Zenith's Cobra-Matic record changer with variable speed control was introduced. This changer had the ability to provide any desired rotation speed between 10 and 85 rpm, unlike the three-speed changers then on the market. As a result, any owner of a Zenith phonograph or combination could play any record, new, old, or prospective, at the exact speed it was recorded, without which true high fidelity is impossible.

The Cobra-Matic record changer was therefore able to play the new 16⅔ rpm Audio Book records without the use of a speed reducer. Within the past two years these records have come on the market with readings from the Holy Bible, both New and Old Testaments; Alice in Wonderland; selections from Edgar Allan Poe; and other popular classics.

PHONEVISION TESTING

Early in 1951, Phonevision was given its first real test. As previously noted, the company had undertaken its subscription TV research in 1931, and announced one perfected system in 1947. Then, with FCC authorization, Zenith conducted a limited commercial test to determine whether or not the public wanted the opportunity to pay directly for such premium programs as top motion pictures not available on sponsored television.

Three hundred families, selected by the National Opinion Research Center at the University of Chicago, were equipped with television sets that could receive all four Chicago commercial TV stations. In addition, by accepting a charge of $1 per picture, any test family could see a feature motion picture being broadcast on a special channel by Phonevision.

Each day for 90 days, Zenith broadcast a Hollywood motion picture, with showings scheduled for afternoon,

Interested crowds gathered at 333 North Michigan Ave. Display Salon during the Phonevision test.

evening, and late evening. The pictures presented a fair cross-section of Hollywood feature productions, but all were at least two years old and had completed their first, second, and third theater runs.

Over the three month period, Zenith test families "went to the movies at home" an average of 1.73 times a week, nearly four times the average rate of motion picture theater attendance at that time. The average patronage per picture was exactly 25% of the possible audience. The company had no legal club with which to collect bills for service, other than discontinuing service to delinquents, but collections exceeded 99% of billings.

In the Spring of 1954, Phonevision—again by FCC authority—was tested in the East. Purpose of the experimental broadcasts was to make final determination of Phonevision's operating characteristics from a high-powered transmitter (WOR-TV) in metropolitan New York. No participation by the public was involved.

While the earlier Chicago test used telephone circuits to carry the decoding signal, WOR transmission carried both the TV picture and the codes. Test data showed clearly that the airborne systems worked just as well or better than anticipated from laboratory and low-powered transmitter tests.

The test in New York also proved conclusively that the Phonevision coding and decoding systems functioned perfectly even in highly congested areas filled with apartment buildings, where hundreds of thousands of potential Phonevision subscribers live.

A PHONEVISION CONTRACT

Late in October of 1954, Zenith negotiated the first foreign contract for the use of Phonevision—in Australia and New Zealand. Under terms of the contract, the Rola Company of Melbourne is to organize a new corporation which will be licensed under Zenith's Australian and New Zealand Phonevision patents. Government approval of the Phonevision systems will be sought in those countries.

On November 29, 1954, Zenith petitioned the FCC to expedite favorable consideration of subscription television. In response the FCC decision of February 11, 1955, instituted a rule-making proceeding to consider approval of subscription television as a broadcast service.

TURRET TUNING

The removal of the television station assignment "freeze" in 1952 not only stimulated the company's business in home receivers, but pointed up the wisdom of Zenith policy in 1948 when turret tuners were made a standard inclusion of all Zenith TV sets. When the freeze was lifted and new station assignments were made in the UHF band, any Zenith TV receiver ever manufactured could be adapted to UHF channels with very simple and inexpensive modification. The only change necessary was the addition of low cost UHF tuning strips. In comparison, most TV sets then in the hands of the public could receive those channels only by the addition of a costly, inefficient UHF converter.

Phonevision's aircode system uses the picture coder, above, to scramble the video portion of the TV signal. Any desired scrambled pattern can be achieved by manual or remote control setting.

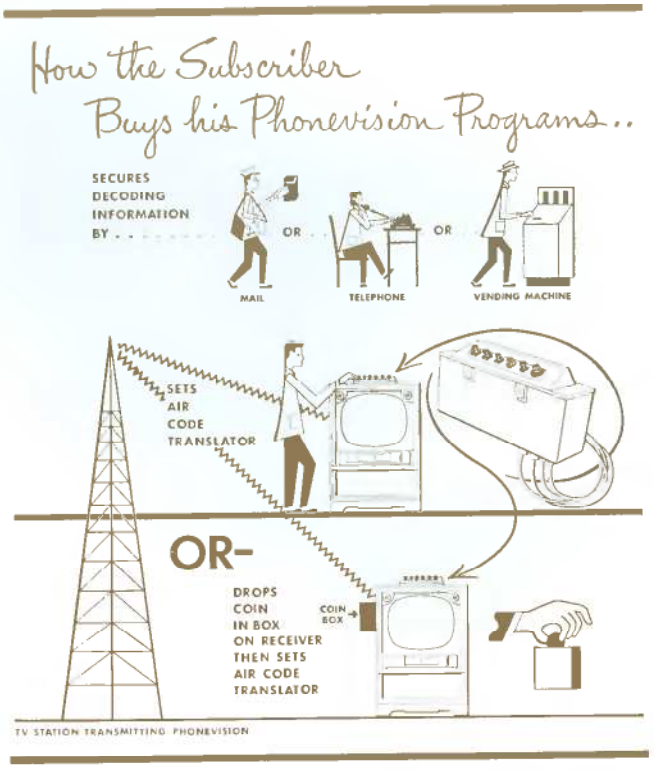
Above, the Phonevision sound coder. Scrambling the picture alone is not sufficient. Sound must be scrambled also to prevent unauthorized reception by a non-subscriber.

As 1952 progressed it turned in the greatest sales record in Zenith history up to that time. Expansion of the company's business prompted management to enlarge facilities at Plant No. 1, Zenith headquarters at 6001 West Dickens Avenue, Chicago. This proposed extension, with an estimated cost of more than $4,000,000, was intended to facilitate the job of packing and shipping company products, and to provide a new heating plant with capacity to handle the needs of the entire factory and office complex.

The succeeding year brought an increase in the flood of products leaving Zenith plants, and a number of technical advances that were characteristic of the company's endless drive to improve its products.

COBRA-MATIC RECORD CHANGER WITH STROBOSCOPE

Always a specialist in the field of recorded sound, Zenith made a signal contribution to the art of recorded music in 1953 when it incorporated a stroboscope with its Cobra-Matic record changers. The significance of this was at first more apparent to technicians than to phonograph users generally, but the general public was not long in realizing the value of the device. It is a fact that recorded music will not play back at exact pitch and timbre unless the player turntable revolves at the exact speed employed in making the initial recording. Zenith had previously equipped its record changers with a speed regulator, permitting infinite speed control between 10 and 85 rpm. What it now did was to incorporate a laboratory type instrument, a stroboscope, that provided the user with a precise, visual check of accuracy in playing speed. The user not only had this visual evidence—he also had the means to correct it if the speed was not right on the dot of 33⅓, 45, 78, or 16⅔ rpm.



The Phonevision subscriber gets clear pictures and sound by properly adjusting the decoder mechanism on the TV set.

A "magic brain" Phonevision computer supplies proper decoding information to any subscriber requesting it by 'phone.

Color TV research and development by Zenith and Rauland provided the first 21-inch rectangular 3-gun color tube in 1954.

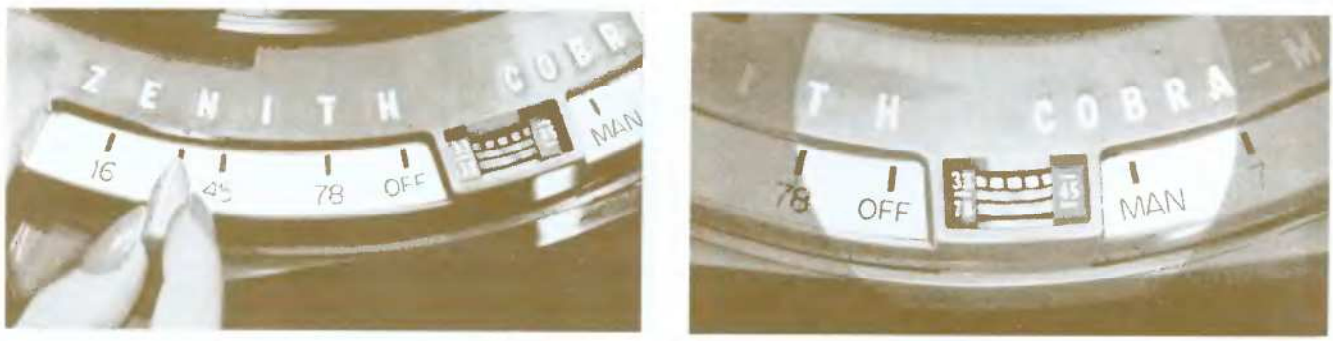
COLOR TELEVISION

The first organized work of Zenith engineers on color television started in 1940, at which time all necessary VHF transmitter, receiver and studio equipment, including direct pickup cameras, were constructed in the Zenith laboratories. Experimental work continued with this equipment until all experimentation ceased because of the war. The first color broadcasts in Chicago were transmitted over Zenith's VHF station in 1940 and 1941.

In November, 1945, experimental work was resumed on the pre-war color equipment, and color broadcasting was resumed in 1946 on the new UHF transmitter equipment built in the Zenith laboratories. Before the National Television Standards Committee was established in 1950, Zenith's color equipment utilized the field sequential system. Other Chicago manufacturers used Zenith's color transmission for their own color experiments, no other color signals being available in Chicago up to then.

Zenith built several sets of color signal generating equipment in 1950. One set was delivered to The Rauland Corporation for use in testing color picture tubes which they were developing. Another set of equipment also utilized the multiplexing equipment and was later used by the NTSC for developing color television standards. These standards ultimately incorporated many of the principles of Zenith's multiplexing equipment.

In the fall of 1950 Zenith was transmitting the NTSC type color signals. By then it had become apparent that the CBS field sequential system was not practical and Zenith's entire efforts were thereafter devoted to the



Among Zenith high fidelity advances are the speed control continuously variable from 10 to 85 rpm and the stroboscope indicator. Without them true high fidelity is impossible.

multiplex system which was ultimately adopted by the NTSC and the Federal Communications Commission. By 1951 Zenith had established a regular schedule calling for color transmission one hour each day, Monday, Wednesday and Friday over its VHF and UHF stations. This schedule continued with only minor interruptions until 1953.

As the year 1953 neared its close, the Federal Communications Commission gave its approval to the NTSC system of color television. As a pioneer in the color field, Zenith had evolved a color wheel system years before, and had built color wheel receivers for the CBS system.

Zenith had also been instrumental in development work connected with the NTSC system, using its Chicago TV transmitter and its engineering and research facilities to the fullest. When the first "compatible" color sets were demonstrated to the FCC by the industry in October, 1953, Zenith was one of the 13 manufacturers to participate in the demonstration. Further Zenith demonstrated its own color tube in its own color set—there were only two other manufacturers able to do so.

But, though compatible color television had been approved by the Commission, Zenith was the first manufacturer to classify color at that stage as an interim development. The company stated its belief that the available three-gun color tube was too complicated, that the pictures were too small, and that the price was too high for popular appeal. Zenith demonstrated color sets but offered none for sale. The company was emphatic in stating that it would not make sets for the public under existing conditions, but that Zenith would be very definitely in color set production as soon as good size picture tubes with simplified circuitry and reduced cost would combine to make a useful consumer product. Meantime, the company redoubled its research efforts to bring that day closer.

One of the products of this continuing research was demonstrated to Zenith distributors in mid-1954. It was a Zenith color television set equipped with a Raulandmade 21″ rectangular 3-gun picture tube. Again, as Zenith took pains to make clear, this set was not offered for sale.

TOP-TUNING

One of the outstanding engineering developments which the company did offer was a new tuning system for its TV sets that put controls at the top of the cabinet. This was the product of three years' research, and involved not only the basic engineering developments but also required widespread changes in production lines and manufacturing procedure. These tuning refinements were installed in Zenith's Model X, together with a wide range high-fidelity sound system unprecedented in television receiver manufacture.

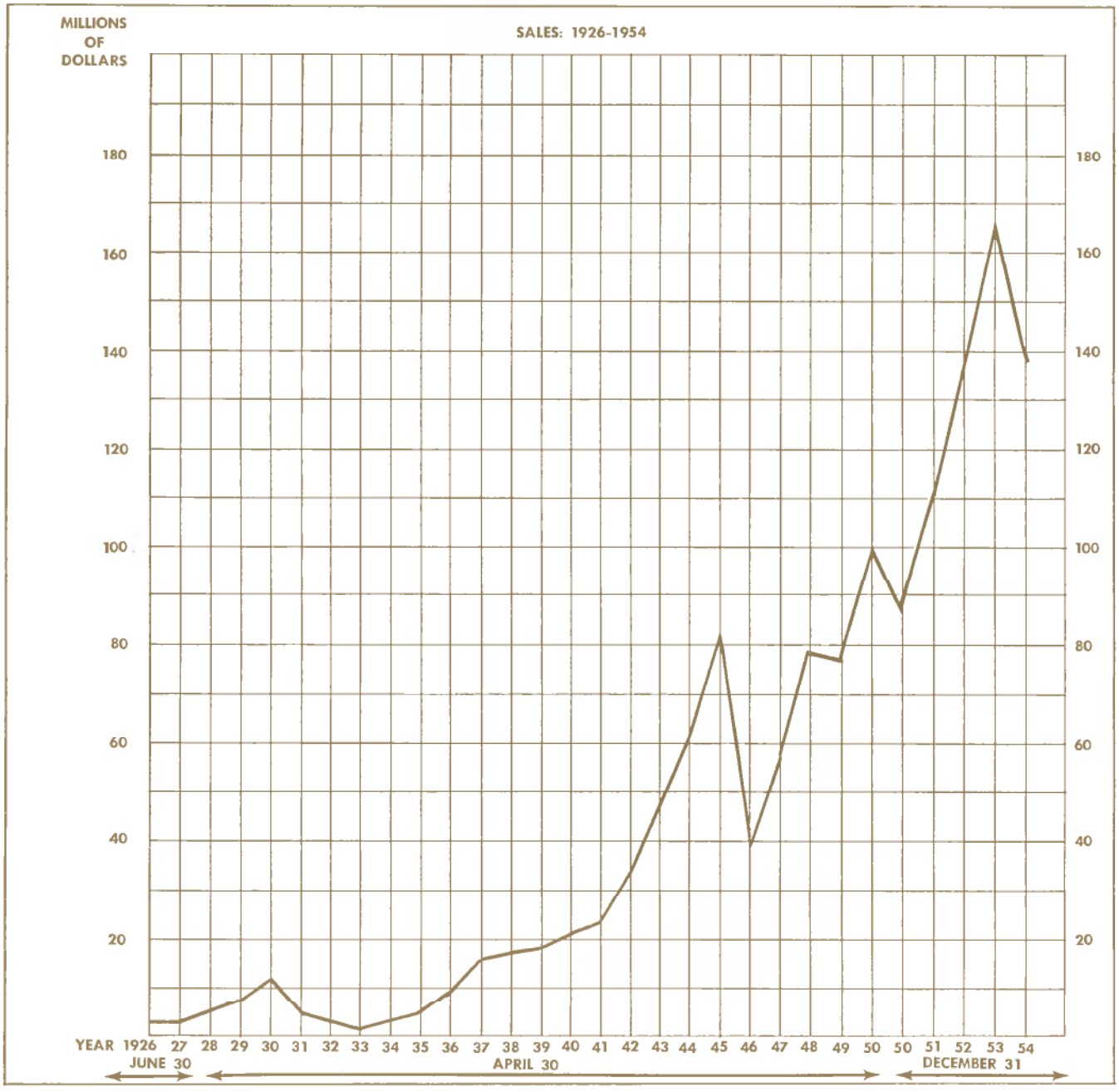
The 1955 Stratosphere combines all the advanced features of Zenith TV, FM-AM radio, and high fidelity phonograph in a superbly designed console of hand-rubbed cherrywood.

HIGH-FIDELITY

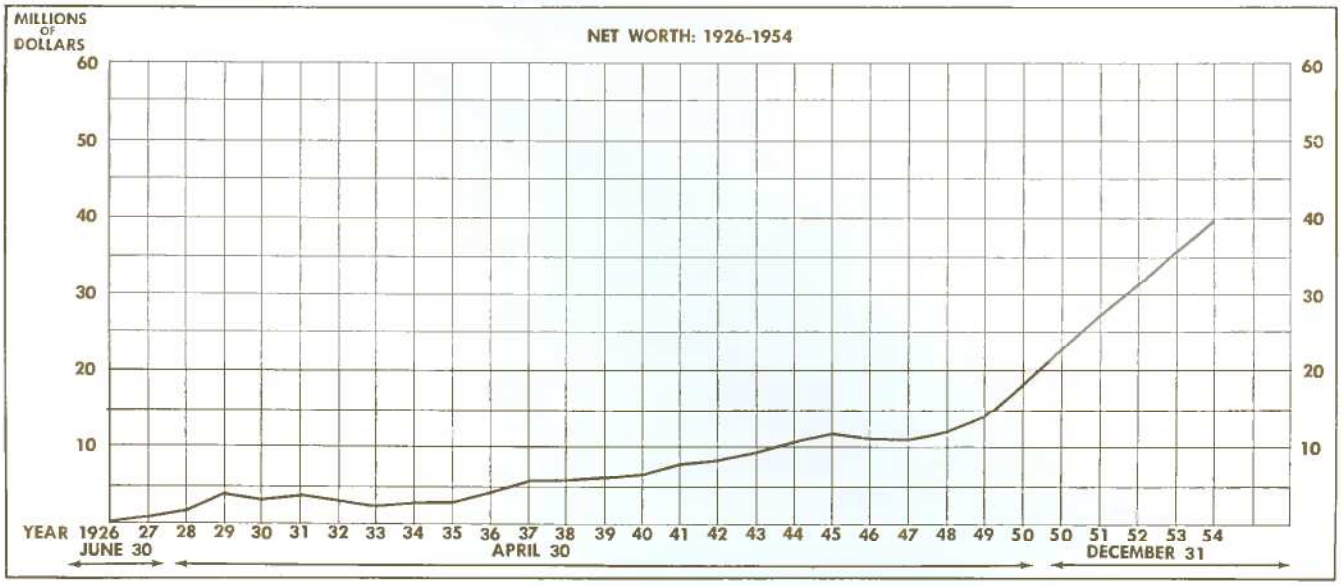
Zenith had made its reentry to the high-fidelity field the previous year, but 1954 found the company producing the most extensive line of such instruments in its history. In many respects, it was probably the largest line in the entire industry, ranging from portable high-fidelity phonographs all the way through table and console models up to one three-way combination radio-phonograph-television instrument with a suggested retail price well above the $1,000 mark. Zenith engineers had equipped these sets with ultra-sensitive pickups, wide band amplifiers, and speaker combinations capable of reproducing all the frequencies found on the best high-fidelity recordings. These high-fidelity amplifier and speaker systems were not confined to radio and phonograph instruments alone, but were included in many of the company's television sets.

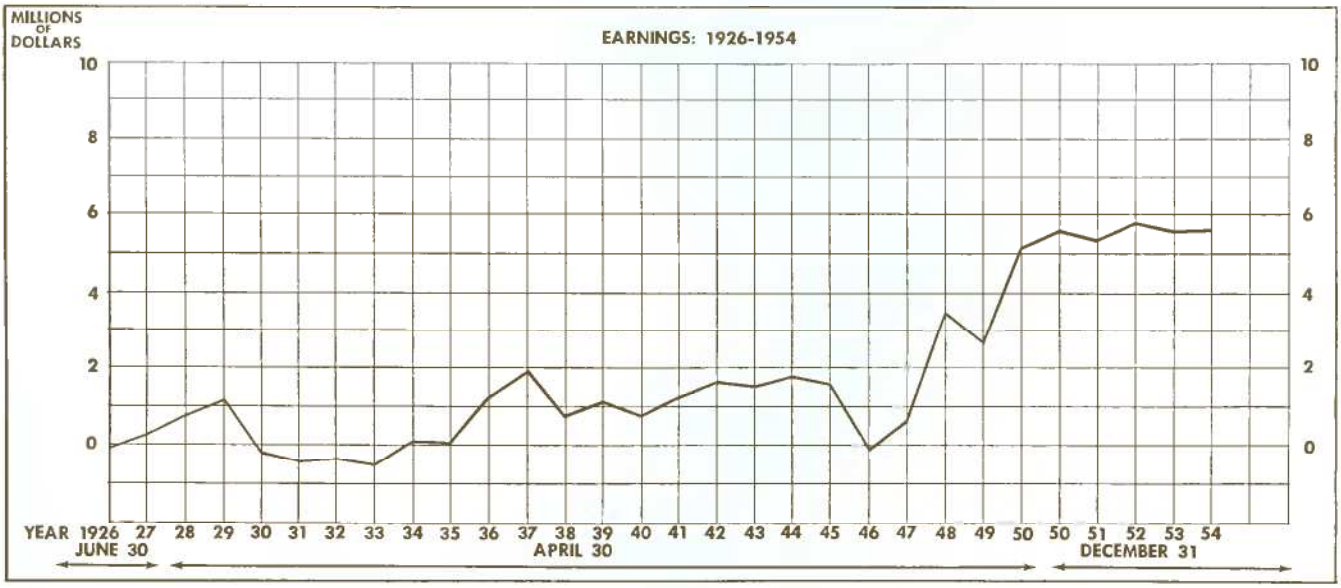
For 36 years, Zenith has been a leader in radio and television. It has ceaselessly devoted its money, its energy, and its brains to providing consumers with better and better radionic products, many of which were originated in its extensive research labs. It has served its Government well in both peace and war. In all areas concerned with its business, it has constantly sought to be a good servant to the public. It sees no reason for changing these objectives, either now or in the future.

ZENITH'S FINANCIAL



PROGRESS: 1926-1954





Zenith Radio Corporation of New York
(Wholly Owned Subsidiary)
527 W. 34th Street, New York City (Leased)

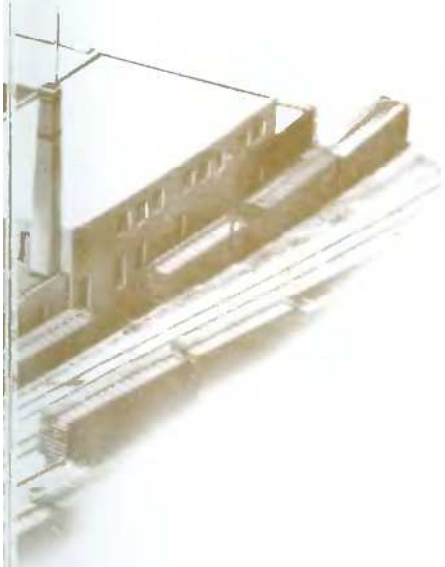
Zenith Radio Corporation, Display Salon
343 N. Michigan Ave., Chicago (Leased)

The Rauland Corporation
(Wholly Owned Subsidiary)
4245 N. Knox Ave., Chicago

Wincharger Corporation
(Wholly Owned Subsidiary)
Sioux City, Iowa

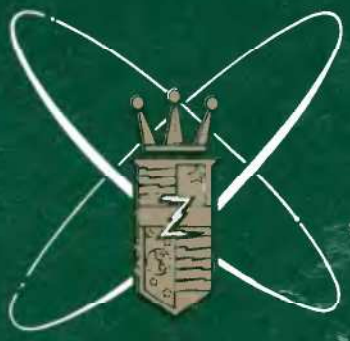
Zenith Radio Corporation

SUBSIDIARIES AND OTHER PROPERTIES AND FACILITIES



Zenith Radio Distributing Corporation
(Wholly Owned Subsidiary)
912 West Washington Blvd., Chicago

Zenith Radio Corporation
Plant Number Four
3501 W. Potomac Ave., Chicago



THE *Royalty* OF RADIO, TELEVISION AND HEARING AIDS